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ONTARIO DEPARTMENT OF  
LANDS & FORESTS

JUL 18 1972

RECEIVED  
OUTLET PROVINCIAL PARK



# THE SANDBANKS

HALLOWELL TOWNSHIP, PRINCE EDWARD COUNTY, ONTARIO

(With Special Reference to:)

(The Lake Ontario Cement Limited Pit)

YEO LAKE

(WEST)

Ontario Ministry of Natural Resources

LEO BERNIER  
Minister

WALTER Q. MACNEE  
Deputy Minister



DR. WALTER M. TOVELL

Associate Director

and

Chief Executive Officer

Royal Ontario Museum

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Prepared for:

**THE MINISTRY OF NATURAL RESOURCES**

**OF**

**THE PROVINCE OF ONTARIO**

By:

**WALTER M. TOVELL**

**ASSOCIATE DIRECTOR, ROYAL ONTARIO MUSEUM**

**26 JUNE 1972**

**DR. WALTER M. TOVELL**

**Associate Director  
and  
Chief Executive Officer  
Royal Ontario Museum**

In addition to Dr. Towell's full-time position at the Royal Ontario Museum, he is:

**Associate Professor, College of Education, University of Toronto.**

**Associate Professor, Department of Geology, University of Toronto.**

**Associate – Institute of Environmental Sciences and Engineering, University of Toronto.**

**Authority Member and Vice-Chairman of the Information and Education Advisory Board, Metropolitan Toronto and Region Conservation Authority.**

**Past President – Toronto Field Naturalists' Club.**

**Past President – Federation of Ontario Naturalists.**

**Past Chairman – Canadian Audubon Society (now the Canadian Nature Federation).**

**Member of Board of Governors, The Crescent School.**

**Director – Canadian National Sportsmen's Show.**

**Director – Metropolitan Toronto Zoological Society.**

## THE SANDBANKS HALLOWELL TOWNSHIP, PRINCE EDWARD COUNTY, ONTARIO

### INTRODUCTION

On 14 April 1972 the writer signed a contract (Exhibit 1) with the Ontario Government (Ministry of Natural Resources) to undertake an investigation of the 16.02 acres in the Township of Hallowell, County of Prince Edward, more or less described in letters patent dated 12 January 1968 granting the Lake Ontario Cement Limited (hereafter referred to as LOCL) the right to remove sand under a 75-year lease granted effective 1 January 1965, as Crown Lease No. 2928 (Exhibit 2). This property adjoins the Sandbanks Provincial Park established 2 June 1970, Ontario Regulation 65/70.

The writer was asked to investigate the physical and aesthetic effects on the environment of the area and particularly the effects on the Sandbanks Provincial Park if LOCL continues to remove sand from the site. He was also asked to look into the feasibility of providing LOCL with an alternate site for suitable sand in exchange for the surrender-of-rights of the company at their present site.

In order to observe and understand the problems, the writer made two trips to the Picton area. The first of these in the company of Dr. Vagners, a provincial geologist on the staff of the Ministry of Natural Resources, and Dr. W.G. Wahl, a consulting geologist. The purpose of this trip was to examine the site, and in particular, the quarry and its position with respect to the boundaries of the provincial park and observe the general geological processes that are operating in the area. At the same time he examined and sampled some possible alternate sites. This trip was undertaken 20, 21 April 1972.

A second trip was made on 31 May 1972. The quarry was not visited on this trip but discussions were held with a senior company official and members of the local government.

The pit operated by LOCL was mapped by Wahl and Vagners. Both reports are appended. The aim of these surveys was to determine the amount of sand remaining on the lease land and both results are similar. Wahl states that there will be approximately 128,000 tons of sand remaining within the pit area, if it is . . .

“excavated under the Mining Act now in effect. If, however, the Pits and Quarries Act of 1971 becomes effective, this will reduce the amount of sand to approximately 84,000 tons.”

The estimate, therefore, is that at the **present rate of excavation** this pit has a maximum life of 2 to 3 years.

In discussions with LOCL it was pointed out to Tovell that the pit has a longer life than appears from these figures, because the amount of sand that is quarried depends on the composition of the limestone used in the cement-making process at the plant in Picton. Basically, the chemical composition of the sand is what is important, and as the composition of the limestone changes the amount of sand required from the pit will vary. Only a cement expert can evaluate the life of the quarry if all parameters are taken into account. Also, the estimates do not take into account the amount of sand blown into the pit to which the company is entitled. The amount of sand moved into the pit in this manner remains unknown.

Some of these factors must have been considered during the negotiations of the lease which runs for 75 years beginning 1 January 1965. The indication that these factors were considered is to be found in a letter dated 15 November 1963 from Mr. R. D. MacLean, of the Portland Cement Company Limited (the predecessor of Lake Ontario Cement Limited). It is stated at that time that the company had reserves of limestone in Picton in the neighbourhood of 145 million tons which . . .

“on the basis of our present consumption of one million tons per year, and allowing that some of the area would be required for roads, represents at least 100 years of limestone. In our opinion it is only reasonable that we have a corresponding reserve of sand.”

## ENVIRONMENTAL FACTORS

The region generally referred to as the Sandbanks lies for the most part on a baymouth bar that separates Lake Ontario from West Lake. The dunes that characterize the region have developed from wind blown accumulations of beach sands. Any discussion of "environmental deterioration" or "ecological disaster" with respect to the area of the dunes must be prefaced by a resume of the history of settlement of the area.

The region was first settled in the early 1800's with the first survey in 1810. At this time, the natural vegetation of the area included cedar and mixed hardwoods. With settlement timber was cut and grazing of cattle took place in the area where the timber stood. The practice of grazing continued for some time. These practices combined to remove the vegetation and allow sand to start drifting. This is when the great environmental change occurred.

In the 1930's the late Dr. A. H. Richardson, a recognized authority and pioneer in conservation work in Ontario, indicated for the first time that between 1852 and 1881 there was considerable drifting of the sand to the south and east.

The considerable drifting of sand that took place between 1852 and the early 1900's led to the beginnings of a reforestation programme by the Ontario Government. (Dr. Richardson was a part of this programme). The plantings consisted of hardwoods and conifers. The programme succeeded in stabilizing the dunes that were migrating southeastward. The plantations, of course, produced a new environmental regime for the southern part of the dune area.

Between 1912 and 1922 a brick-making plant was operating on the site of the present quarry and the remains of the plant are still visible in the LOCL pit. Comparative photographs are available for the site taken in 1922 and 1972. These show clearly the position of the brick-making plant with respect to the present quarry, and the changes due to drifting sand.

The operations of the brick-making plant were apparently the first commercial operations in the Sandbanks area making use of the sand. Following a series of transactions between individuals the lands owned (and adjoining?) the brick-making plant property became the property of the LOCL with a previous owner being Mr. MacFarland. Quarrying operations in the 1950's extended the quarry.

On 15 January 1959 Mr. J. K. Benner OLS, submitted the results of his surveys to establish the boundaries of the then being considered and projected Sandbanks Provincial Park. His careful and detailed surveys established the fact that the government had reforested lands owned by the company then operating the quarry and the company was removing sand from Crown Land. The oversight was due to lost and destroyed fences and survey markers resulting from the unstable sand. Benner's first plan also clearly demonstrated the amount of accretion due to the blowing sand that had taken place since 1852, and the change in the position of the shoreline of West Lake since 1838. It must be understood that at the time the Benner survey the only designated parkland consisted of two small parcels used for parking lots about one-half mile southwest of the quarry, and the ownership of the accretion was in doubt.

Following the Benner survey a lease in exchange-for-deed between the Crown and LOCL was negotiated and signed on 12 June 1966 and made retroactive to 1 January 1965. The lease was to run for 75 years from the date, the time period being based presumably on the then known reserves of limestone in the Picton Quarry. Under the terms of the transaction LOCL granted 19-3/4 acres of land to the Crown and obtained 16.02 acres on lease for the purpose of removing sand. It should be noted that the final decision was based on the opinion of Mr. D. A. Crosbie, Department Solicitor, who was of the opinion that MacFarland's land (now LOCL) was originally bounded by the lake and that the present owner may, therefore, have a valid claim by accretion for a shoreline at the time the opinion was given in 1960. Mr. Crosbie wrote . . .

"it would appear that in view of the many difficulties connected with the ownership of the portion of West Lake filled in by the movement of sand dunes, if some agreement can be reached with MacFarland which will provide MacFarland with a satisfactory supply of sand and at the same time permit the Crown to control the shoreline of West Lake and eventually obtain title to all of MacFarland's property, such an agreement would be advisable."

Much of the present outcry in respect to the Sandbanks is based on the fact that the dunes within the park are being

continued . . .

damaged by digging away sand in the pit on land leased to the company. Much has also been made of the fact that one of the highest dunes in the park is being thus attacked. Misunderstandings are prevalent with respect to the age of the dunes which are less than 100 years old in the vicinity of the LOCL lease land. **It would appear, therefore, that a solution must be found that would provide a means whereby the LOCL lease can be phased out as quickly as possible without damage to the local economics.**

It is of utmost necessity to understand that dunes are transitory in nature, the sands shift by day and by night in response to the wind. The fact that a particular dune is the highest dune today does not mean it will be the highest dune tomorrow. Indeed, a perusal of records indicate that dunes in the area have been described variously as 75-feet high to 90-feet high. The Sandbanks Provincial Park input is an area where the **process** of dune formation can be observed, rather than an area where dunes themselves can be preserved, because it is impossible to preserve them. **They are not static land forms, they are dynamic land forms that change very quickly.** From the geo-environmental point of view, a bald sand dune that is 15-feet high is not very different from one that is 60 or 100-feet high although it is true that there is a difference in the aesthetics. It should be pointed out that in the area of the Sandbanks Provincial Park, consisting of some 1802 acres, the individual dunes are not as important as the whole assemblage of dunes. Most of the dunes occur in the southern portion of the park. If the area south of the narrow constriction in the baymouth bar, located about 1-3/4 miles northeast of the LOCL lease land, is studied from aerial photographs, it can be determined that this area contains about 400 acres of dunes, of which 100 acres (25%) have been stabilized by reforestation. The remaining 300 acres are bald dunes with drifting sands. The LOCL lease land contains about 3 acres of unstabilized dune at present, or about 1% of total bald-headed dune area within the park.

It can also be said that if the sand in the quarry is not removed, the blow sand would end up in West Lake and the high dune adjacent to the LOCL lease land would be blown into West Lake. Additionally, without the quarrying operations it is entirely possible that some of the sand would have drifted over adjacent property.

#### **ALTERNATE SOURCE**

Much has been made of an alternate source for the sand. Tovell spent the better part of a day inspecting and sampling with Vagners, several sand and gravel quarries, and several possible sites for alternate sources of sand, associated with a large esker on which is located the "Ridge Road" running southwest from Picton. The possible sand sources were sampled by a probe, and were well removed from the crest of the esker. The location and results of the grain size and chemical analysis of these samples are given in Vagner's report. However, no attempt was made to estimate the reserves, and such could not be made without drilling. However, some of the analyses appear at first glance to be encouraging. Sand, of course, is associated with gravels in the esker proper, but no analyses of these deposits were made.

It should be pointed out that some of the sand underlies farmland, and undoubtedly some of this resource would be lost to the region if sand were removed; also a considerable amount of rehabilitation would have to be undertaken, particularly with the enforcement of the Pits and Quarries Act. According to the LOCL officials, there is a problem associated with the chemistry of the esker sands, so that, were it used, additives might be needed for which a subsidy might be required. In addition there would be additional costs incurred because of land acquisition or lease, screening and crushing, all of which might have economic repercussions. Additionally, the question could well be asked as to whether or not large quarrying operations in the vicinity of the esker might not have a more serious effect on the environment than further work on the Sandbanks lease land.

Another alternate source is possible. It is my understanding that dredging will begin shortly in the vicinity of Wellers Bay (25 miles from Picton) and that the dredged materials, believed to be sand, are being dumped on an adjacent island. This material might well prove suitable as an alternate source for the company. I do not know whether tests have been undertaken on it.

The third possibility of an alternate source lies in the reassessment of the pit itself and a renegotiation of the lease. Since sand appears to have blown into West Lake over at least a part of the leased land over the past 120 years or so, it might be feasible to excavate by dragline **below the present quarry floor** which legally is set at 244.10 AMSL. The only way to establish the feasibility of this suggestion is by drilling to determine reserves.

## CONCLUSIONS AND RECOMMENDATIONS

The removal of sand from the LOCL lease land adjacent to the Sandbanks Provincial Park has created a situation which would be best solved by a surrender of the LOCL lease as quickly as possible and the incorporation of the leased land into the Sandbanks Provincial Park. The terms of the surrender, however, must be such that the flow of raw materials on which the LOCL operations are based in Picton is not interrupted or impaired. To these ends I make the following recommendations.

1. LOCL should be informed immediately of the dredging operations within the area so that they can sample the dredged material and assess its suitability as a replacement in part for the material from the Sandbanks.
2. LOCL should be asked to renegotiate their lease for a much shorter period time e.g. 2 to 3 years, under the condition that LOCL be allowed to remove 128,000 tons of sand and then surrender all further rights in the lease.

In furtherance of this recommendation it is recommended that:

- (a) The Province would waive the requirements of the Pits and Quarries Control Act relating to site lands and rehabilitation of the pit. Plans are due 1 September 1972
  - (b) The Province should confer with LOCL to ascertain if both the Province and LOCL accept this recommendation.
  - (c) In order to interfere less with the shoreline in the vicinity of the high dune the Province would allow the LOCL to proceed immediately to explore below the pit floor (Elevation 244.10) along and in from the shores of West Lake, to determine the reserve of sands present in the area of the pit already excavated. A period of 30 days should be sufficient for this work.
  - (d) The 128,000 tons of sand be reckoned from 26 April 1972, the date that the removal of sand began anew with the removal of the half-load restriction.
  - (e) During the period of exploration below the quarry floor the LOCL should be required to restrict its quarrying operations to the minimum amount needed for its daily operations.
  - (f) When the drilling results are known, the Province and LOCL should confer on the total amount of sand to be removed from above and below Elevation 244.10 over the leased land. The removal of the sand required from the northern apex of the triangle of the leased land should be undertaken in such a way as to minimize damage to the dunes.
3. Should the drilling within the leased land establish uneconomic or insufficient reserves of sand below Elevation 244.10, then LOCL will have to use sand on the leased land until alternate sources (such as possibly the esker) are brought into production. However, the Province could make certain concessions with respect to the Mining Act, (section 411, 1971 Ed.) so that sand could be extracted from the present leased land closer to the park boundaries, to obtain a quicker surrender of the lease.

\* The Province could also alter the northern boundary of the leased land so that the water's edge of West Lake would be the northerly leased land boundary instead of the 987.05-foot line that bears S 56° 25'E.

Respectfully submitted,

Walter M. Tovell

26 June 1972

## CAPTIONS FOR ILLUSTRATIVE MATERIAL

- FIGURE 1 Photomosaic of the baymouth bar separating Lake Ontario from West Lake showing the LOCL leased land in yellow, together with the remaining portion of dune sand in the lease.
- FIGURE 2 The Benner Plan, showing the changing shoreline of West Lake, the change in position of the dune front, and the LOCL leased land.
- FIGURE 3 \* Cattle "grazing" of sand dunes in the 1920's or earlier. (Exact date unknown)
- FIGURE 4 \* Sand dunes with remains of vegetation. Lake Ontario in the background. Early 1920's or earlier. (Exact date unknown)
- FIGURE 5 \* Remains of Brick Plant in LOCL pit. LOCL photograph 27 November 1971.
- FIGURE 6 Drawing brick from West Lake Brick Plant, 12 October 1922.
- FIGURE 7 \* Brick Plant with Tubbs Island in background, about 1922.
- FIGURE 8 \* LOCL pit, 27 November 1971, with Tubbs Island in the background. Compare with Figure 7 and note the changes in the shoreline. (LOCL photograph)
- FIGURE 9 \* Abandoned Brick Plant with sand encroaching on the buildings. (Exact date unknown, possibly 1922)
- FIGURES 10, 11, and 12 \* Illustrations of advancing sand and changes in West Lake shoreline between 1852, 1881 and 1922. Prepared by Dr. A. H. Richardson. Copies provided by LOCL.





RAILWAYS

Mallowell Sta

Poplar I.

Johnston I.

Hickory I.

Garrett I.

Gasket I.

YEO LAKE

(WEST)

Whips

Sand Banks

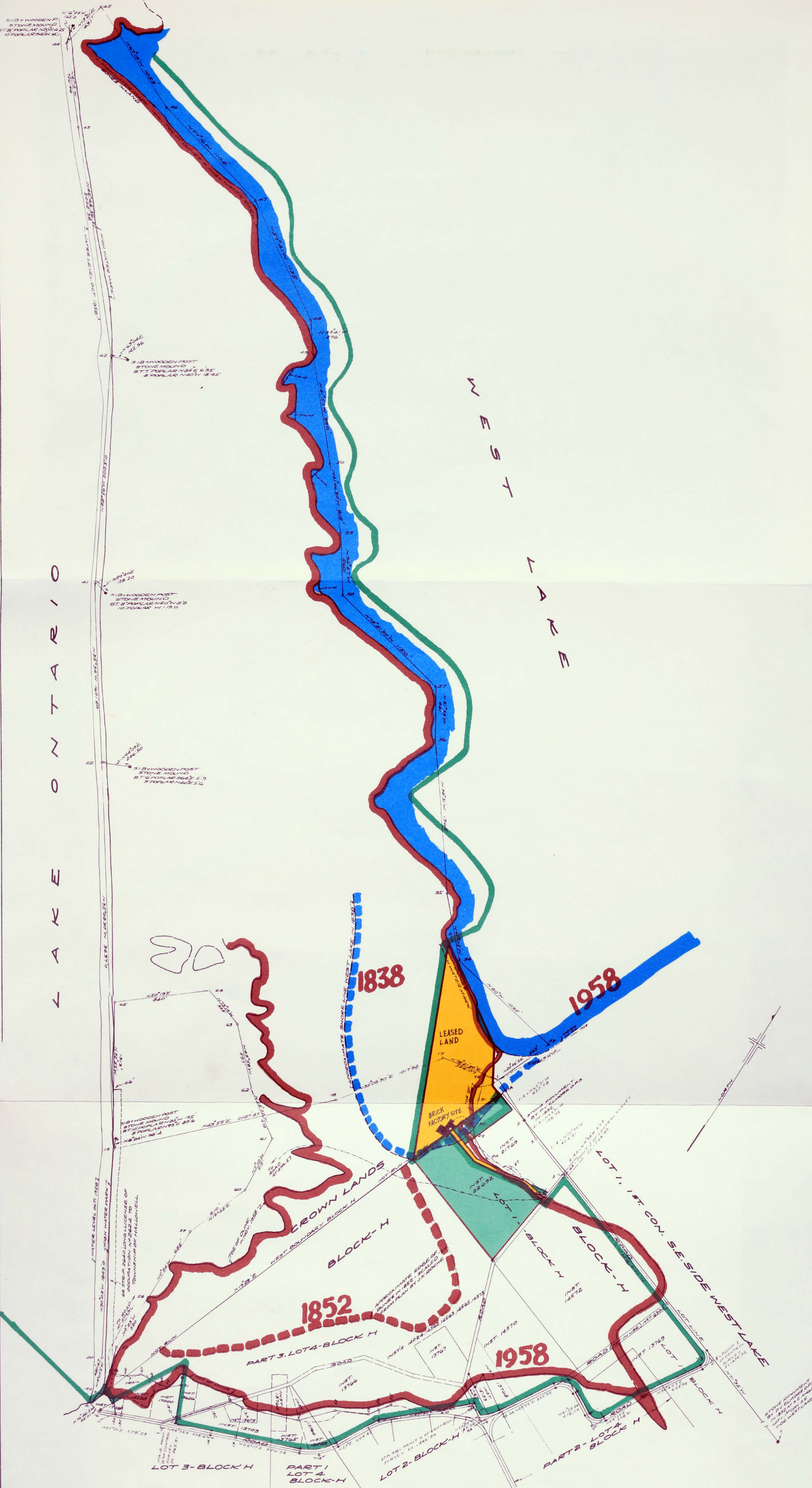
Owen Pt

WELLINGTON



L A K E O N T A R I O

W E S T L A K E



NOTE  
 FOR DETAIL SEE PLAN ON SCALE 100' = 1" AND FIELD NOTES,  
 BEARINGS ASTROGNOMIC AND ARE REFERRED TO MERIDIAN  
 THROUGH ORIGINAL STONE MONUMENT NEAR MOST  
 NORTHERLY ANGLE OF BLOCK H.  
 COPY OF PLAN OF BLOCK (GORE) H BY JOHN K. ROCHE  
 P.L.S. IS OF RECORD BUT UNNUMBERED IN REGISTRY  
 OFFICE FOR THE COUNTY OF PRINCE EDWARD AT FREDON,  
 WHERE DISTANCES ALONG TRAVERSE LINES ARE SHOWN  
 IN EVEN FEET MEASUREMENTS WERE TAKEN BY STADIA  
 ■ - INDICATES IRON BAR 1" SQUARE + WOODEN GUIDE  
 POST + STONE MOUND  
 15 - INDICATES TRAVERSE STATION AND NUMBER  
 --- INDICATES CENTRE LINES OF ROADS WHICH  
 ARE TRAVERSED WHEN MARKED WITH STATIONS

H219 SHEET NO. 1 16071  
**SAND BANKS PROVINCIAL PARK**  
 PART OF BLOCK H AND  
 CROWN LANDS WEST THEREOF  
 TOWNSHIP OF HALLOWELL  
 COUNTY OF PRINCE EDWARD  
 ONTARIO  
 SCALE: - 300 FEET = 1 INCH  
 POST CREDIT ONT.  
 JAN. 18TH 1959  
 ADDITIONS JUNE 30TH 1961  
 G. K. Banner  
 ONTARIO LAND SURVEYOR







11 AM. SAT NOV 27-71  
SANDBANKS



Drawing Bricks  
from West Lake Brick Plant  
Oct 12, 1922  
West Lake  
Ontario

TUBBS ISLAND 1922

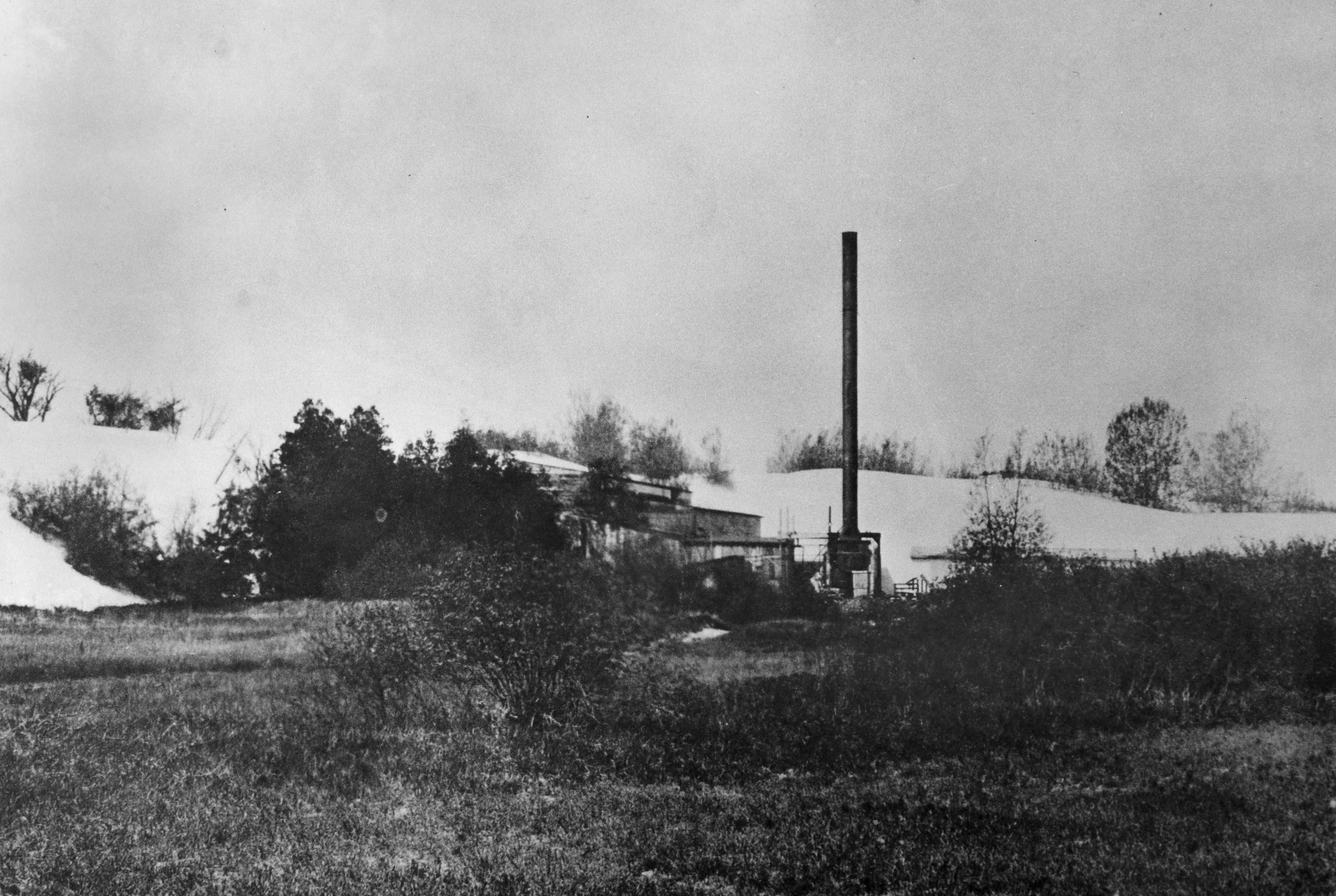
West Lake Brick  
and Products Co.  
and site for dock.

TUBBS ISLAND 1971



11AM, SAT NOV 27-71  
SANDBANKS





LAKE  
ONTARIO

WEST  
LAKE

LAKE  
ONTARIO

EDGE OF SAND DRIFT BY  
SURVEY MADE IN 1852

FIG 10



LAKE  
ONTARIO

WEST  
LAKE

LAKE  
ONTARIO

FIG 11

EDGE OF SAND DRIFT BY  
SURVEY MADE IN 1881



LAKE  
ONTARIO

WEST  
LAKE

EDGE OF SAND DRIFT BY  
SURVEY MADE IN 1922

LAKE  
ONTARIO

FIG 12

